

Atlantic Richfield Company

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July 13, 2017

Lynda Deschambault
Remedial Project Manager, Superfund Division
U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street, 10th Floor (SFD 7-1)
San Francisco, California 94105

Subject: U.S. EPA Comments (Dated June 13, 2017) and LRWQCB Comments (Dated November 28, 2016) on Atlantic Richfield's Interim 2015-2016 Upper Tributary Report
Leviathan Mine Site
Alpine County, California

Dear Ms. Deschambault:

Atlantic Richfield Company (Atlantic Richfield) has received the U.S. Environmental Protection Agency's (U.S. EPA's) letter dated June 13, 2017, which provides comments on our *Interim 2015-2016 Upper Tributary Report, Leviathan Mine Site, Alpine County, California* (dated November 2, 2016). The Upper Tributary characterization is being performed in partial fulfillment of the requirements of the Statement of Work attached to the *Administrative Order for Remedial Investigation and Feasibility Study, Comprehensive Environmental Response, Compensation, and Liability Act Docket No. 2008-18* issued by the U.S. EPA on June 23, 2008.

The U.S. EPA requested that Atlantic Richfield provide a response within 30 days stating that Atlantic Richfield concurs with the comments and will incorporate them as requested or identifying any comments that Atlantic Richfield disagrees with, does not concur with, or will not incorporate into the next version of the Groundwater Technical Data Summary Report (TDSR), which is where data from the Upper Tributary will be reported on henceforth. In general, Atlantic Richfield has no significant objections to the comments or to incorporating the work requested into the next version of the Groundwater TDSR. However, we do feel that clarification to selected comments is necessary. We have also reviewed comments from the Lahontan Regional Water Quality Control Board (LRWQCB) dated November 28, 2016, several of which are similar to U.S. EPA comments. A complete response to both U.S. EPA and LRWQCB comments will be provided with the full report submittal, and we believe that the issues described in both sets of comments can be addressed in the final version of the Groundwater TDSR to be submitted in December 2017. Following are selected EPA comments where Atlantic Richfield believes clarification and discussion is warranted herein:

U.S. EPA COMMENT S2 - SECTION 7.0 SUMMARY AND CONCLUSIONS FIRST BULLET ON PAGE 21:

The question from Section 2.0 Treatability Study Objectives concerns the total volume of water entering the site and is not limited to the volume of surface water that enters the subsurface (See Section 2.0 Question 1). Please revise the text for consistency.



ARC discusses stream flow losses without discussion of their significance. For example, the loss between SF-01 and SF-02 is noted as 7 gallons per minute (gpm), but it is unclear if the loss is significant with respect to the flow measurement error (precision and accuracy). If the loss is significant, the volume lost from the upper tributary to the subsurface (volume that could be intercepted and directed away from mine waste) should be readily estimated.

The text combines discussion of loss from the unlined portion of the Upper Tributary (i.e. flow at SF-02 minus the flow at SF-01) with the flow gain along the concrete lined portions of the Upper Tributary (i.e. flow at SF-03 minus flow at SF-02). Please separate the discussion of flow loss/gain for the reaches. In addition, discussion of the inflow to the lined reach of the Upper Tributary should be supported by citing appropriate data (groundwater levels in adjacent piezometers, field observations of overland flow, etc.) or removed from the text.

Atlantic Richfield's clarification to U.S. EPA Comment S2:

- ☐ The first bullet on page 21 and Question 1 in Section 2 address surface water only. They read "What volume of surface water enters the subsurface at the mine site year-round through the Upper Tributary?" Groundwater issues are referenced in questions 5 through 8.
- ☐ The interaction between streamflow and groundwater recharge was interpreted in the report as generally a weak connection. However, a discussion on the significance of stream flow losses will be added to the final version of the Groundwater TDSR.
- ☐ Stream gains along the lined reach between SF-2 and SF-03 are supported by stream gauge measurements. This discussion may be elaborated in the final version of the Groundwater TDSR.

U.S. EPA COMMENT S4 - SECTION 7.0 SUMMARY AND CONCLUSIONS FIFTH BULLET ON PAGE 21:

The question refers to surface water/groundwater interaction in the Upper Tributary where it contacts mine waste. The discussion focuses on groundwater in deep piezometers that cross the mine waste/native material interface beneath Ponds 2. While groundwater fluctuations in this zone are of interest to the RI/FS, they are not relevant to the groundwater/surface water interactions assessment of a cutoff wall at the southwest and southeast perimeter of the Pond 2 area. Please revise the text to fully discuss the surface water/groundwater interactions along the Pond 2 perimeter area.

Atlantic Richfield's clarification to U.S. EPA Comment S4:

- ☐ Until the 2016-2017 wet season, there was insufficient water in shallow piezometers within the mine waste to interpret the possible flux of surface water into mine waste beneath Ponds 2N and 2S. Consequently, the interpretation in the report used inferences from water levels in deeper piezometers with screen intervals across the mine waste/bedrock interface. Increased water levels at the mine waste/bedrock interface suggest potential groundwater flux under Ponds 2N and 2S. However, some surface water may be infiltrating along the native materials that are present in

varying thicknesses between the bottoms of mine waste and tops of bedrock because the native materials are more transmissive than mine waste or bedrock. Thus, it was logical to include discussion of these relatively deeper water levels as another line of evidence to develop the conceptual understanding of the volume of water potentially entering (or not entering) mine waste in this area of the site. Text will be revised and enhanced in the final version of the Groundwater TDSR to provide greater discussion of groundwater/surface water interactions. An assessment of a cutoff wall in this area will be performed during the Feasibility Study.

U.S. EPA COMMENT S5 - SECTION 7.0 SUMMARY AND CONCLUSIONS FIRST BULLET ON PAGE 22:

The first sentence notes that groundwater in Piezometers 39 and 47 is 'unlikely to discharge to Leviathan Creek'. Please revise the text to include statements supported by data. i.e. the groundwater from these two piezometers does not discharge to the Upper Tributary, or the text should be deleted.

The second part of the paragraph speculates that shallow groundwater measured at the drive point piezometers is the source for water flowing into the concrete lined reach of the Upper Tributary. Please include reference to supported evidence, or the text should be deleted.

Atlantic Richfield's clarification to U.S. EPA Comment S5:

- ☐ The fact that water levels in PZ-39 and PZ-47 are substantially lower than water levels in other piezometers along the On-Property portion of Leviathan Creek supports the stated conclusion that deeper groundwater coming from these locations is unlikely to emerge as surface water in Leviathan Creek. The discussion will be clarified in the final version of the Groundwater TDSR.
- ☐ Stream gauge data supports the observation of increased flow in the SF-02 to SF-03 reach. Measured heads in deeper intervals (e.g. PZ-39 and PZ-47) are too low to recharge this reach leaving shallow surface water (or sheet flow runoff in the spring) as possible sources. The discussion will be clarified in the final version of the Groundwater TDSR.

U.S. EPA COMMENT ON GRAPH 4-6:

Please separate the graphs of groundwater elevations by elevation range so that different scales can be used to depict meaningful detail. This could entail two or three additional graphs vertically stacked on the same page and with the same horizontal scales aligned so that DPZ, shallow, and deep piezometer fluctuations can be readily compared.

Atlantic Richfield's clarification to U.S. EPA comment on Graph 4-6:

- ☐ Graphs 4-5 and 4-6 are overviews of all piezometer data and streamflow data for 2015 and part of 2016, respectively. They show the relative magnitude of streamflow, comparative water levels, and water level changes and were created in response to past U.S. EPA and Water Board comments on the Groundwater TDSR asking for

consistent scales when presenting data from multiple monitoring wells so that the reader may obtain a sense of relative differences in water level or chemistry changes between wells across the site. The subsequent plots in the Upper Tributary report (graphs 4-7 through 4-15) show the detailed changes in piezometers by logical groupings (e.g., similar water levels). At least six stacked plots would be necessary to show all water levels in detail on a single figure (making it difficult to read), and these plots would be redundant with the plots that follow (graphs 4-7 through 4-15).

U.S. EPA COMMENT ON GRAPH 4-13:

This graph appears to show a relationship between PZ-55 groundwater levels and flow at SF-02. This contradicts text in the third bullet of Section 7.0 on Page 20. Please revise the text.

Atlantic Richfield's clarification to U.S. EPA comment on Graph 4-13:

- ☐ There appears to be some correlation between streamflow at SF-02 and water levels in PZ-55. However, since this is the lined portion of the channel and this is a gaining reach, it seems more likely that the same recharge event caused both rather than streamflow recharge causing water increases in PZ-55. The discussion will be revisited in the final Groundwater TDSR.

U.S. EPA COMMENT ON GRAPH 5-2:

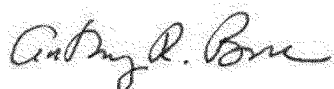
This graph illustrates that Upper Tributary flow measured at SF-01 is often more than flow measured at SF-02. This implies that significant loss of water may be occurring between the two stations. Please estimate the total volume of water lost and assess the value of a subsurface interceptor in this area. Please include text to discuss.

Atlantic Richfield's clarification to U.S. EPA comment on Graph 5-2:

- ☐ Losses in this reach are discussed in the last paragraph of section 5.3 (page 17), restated in Sec 6, bullet 3 (page 19), and again in section 7 in the first bullet (page 21). The discussion will be enhanced to estimate total volume of water lost in the final Groundwater TDSR. An assessment of the value of a subsurface interceptor in this area will be performed during the Feasibility Study.

If you have any questions or comments, please feel free to contact me at (657) 529-4537 or anthony.brown@bp.com.

Sincerely,



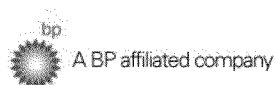
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cc: Gary Riley, U.S. Environmental Protection Agency, Region 9 – via electronic copy

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July 13, 2017
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